Illinois Department of Transportation

Memorandum

To:	ALL BRIDGE DESIGNERS	06.2
From:	Ralph E. Anderson	Ralph E. Anderson
Subject:	Pile Data Guidelines for 2007 Standard Specifications	
Date:	September 13, 2006	

This memorandum was developed to provide guidance to designers on making several necessary changes to contract plans for structures supported by pile foundations, scheduled for letting after January 1, 2007.

The extensive changes from the 2002 Standard Specifications for piling (Section 512) to the new 2007 specifications will require that contract plans be either prepared or modified to be compatible with these new specifications. The new specification utilizes the FHWA Modified Gates formula, in place of the ENR formula, along with new terminology and several pay item changes related to piling. In addition, the Gates formula requires the design capacities be unfactored ultimate or nominal values.

The following summarizes the critical changes necessary to allow current ASD pile designs shown on plans to be modified to correspond to the 2007 specifications:

1. The term “Capacity”, “Design Capacity”, or “Bearing” shown under the Pile Data information, shall be replaced with the term “Allowable Resistance Available”.
2. A new term “Nominal Required Bearing”, shall be added and determined as follows:
   a. For Metal Shell and Concrete Piles use the “Allowable Resistance Available” increased by a factor of 3.0.
   b. For H piles not driven to refusal use the “Allowable Resistance Available” increased by a factor of 2.0.
   c. For H piles specifying refusal use the pile cross sectional area multiplied by 13.5 tons/sq.in. (twice the current refusal definition).
3. The Gates formula requires the Nominal Required Bearing values computed above to be input in kips, so we recommend these values be converted from tons to kips to ensure they are properly used by the contractors in the new formulas.
4. When metal shell or concrete piles are used, metal shell piles shall be specified, the diameter and minimum wall thickness shown, and the following note must be added:
   “The Metal Shell piles shall be according to ASTM A 252 Grade 3.”
5. When Steel H-piles are used, the following note must be added:
   “The Steel H-piles shall be according to AASHTO M270 Grade 50”

6. When the Nominal Required Bearing exceeds 600 kips, the following note shall be added:
   "In lieu of the hammer selection criteria and use of the FHWA Modified Gates formula specified in Section 512 of the Standard Specifications, the Contractor shall conduct a wave equation analysis to establish the driving criteria at all pile foundations which specify a Nominal Required Bearing above 600 kips. The analysis and calculations shall be submitted to the Engineer for approval."
7. When test piles are specified, the following note shall be added:
   "The test pile(s) shall be driven to 110 percent of the Nominal Required Bearing indicated in the pile data information".
8. When Metal Shoes, "Pile Tips" or Points are specified, the term and pay item shall be changed to "Pile Shoes". Pile shoes for test piles are no longer included with the test pile but shall be included in the Pile Shoe pay item quantity.
9. The various driving pay items shall be replaced with the new "Driving Piles" pay item.

Example conversion:

Before, Type: 12" Metal Shell
Capacity: 55 tons
Est Length: 65 ft

After, Type & Size: Metal Shell – 12 in. dia x 0.179 in. walls
Nominal Required Bearing: 330 kips
Allowable Resistance Available: 110 kips
Est Length: 65 ft

If you have questions or comments, please contact Bill Kramer at (217) 782-7773 or Gary Kowalski at (217) 785-2914 of the Bureau of Bridges and Structures for assistance.

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